

# Pantomation: Scoring and Performance Interface

by Tom DeWitt

The Pantomation system is a video/computer instrument which can read scores and follow body movement. Applied to visual music, the system allows notation similar to traditional music composition and performance with control by gesture much like orchestral conducting.

Pantomation scores are graphs of event-number in one dimension versus a parameter of change in the second dimension. The scores are prepared by hand on graph paper, much as a score is written on staff sheets for music. The format of the score is a bar graph sometimes called "Skyline" nota-

tion or change in subtle parts of the reproduction can be accomplished in real time by "conducting" using a baton or the hands. The system is able to perceive the position and velocity of movement of the baton in three dimensions giving direct control over three independent parameters. This is different from traditional conducting gestures which communicate by presenting a pattern of movement to the orchestra, but some simple patterns can be extracted by the Pantomation system. For example, the conductor may assign significance to a downward sweep or a horizontal sweep of the hand, and the computer interface

interactive control). The camera's output signal is processed to isolate the colors used to specify information. In video parlance this known as "chroma keying." The decoded color is then located in space, and this information is sent to a computer which can process, record and output the information either in digital or analog form. Two implementations of the system are currently in use. A laboratory model which uses several large computers resides at the Image Processing Lab of RPI. Over thirty artists have visited the facility on a Services-to-the-Field grant in Media Arts from the National Endowment. A portable

FIG. 2A

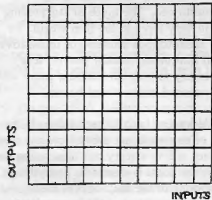


Figure Two. Graphic notation. 2a. Matrix designating ten rows of inputs and ten rows of outputs. 2b. A sequence of notes scored according to "skyline" notation.

FIG. 2B

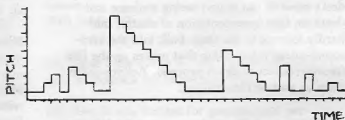
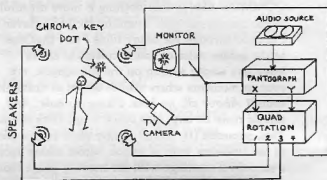


Figure Four. The Electronic Pantograph interprets baton position to distribute a signal to four loudspeakers.

FIG. 4



tion. The duration of each event in a score is separately scored along with the parameters of change, so a single event is notated using several graphs. To facilitate the composition process, many parameters can be notated on the same piece of graph paper using a color code for each parameter. For example, red lines can be used for notation of event duration, blue lines for change in pitch, green lines for change of timbre. In visual music created using video synthesis or computer graphics, these notations could be for change in image color, form, size, etc.

Once a score is loaded in the Pantomation system it is played back exactly as it is written. Articula-

tion will effect a programmed change. However, the system normally is used as a non-contact three dimensional joystick. It can also be used as a non-contact keyboard or fretboard. One demonstration of its use was the performance of an "invisible" bass fiddle which the performer plucked by moving a green glove.

The Pantomation system is based on technology developed at the Image Processing Laboratory of Rensselaer Polytechnic Institute and the Electronic Music Studio of the State University of New York at Albany. A color television camera scans the graph (for reading notation) or the performer (for

version of the system was recently constructed for an Apple II micro-computer. It was used to exhibit the system at the Electra Exposition at the Museum of the Modern Art of the City of Paris in 1984.

Tom DeWitt apprenticed under Stan Vanderbeek in 1965 and received a B.A. in Art and Design from San Francisco State University in 1968. DeWitt's films, *Atmosfear* ('66) and *Fall* ('71) are distributed by the Museum of Modern Art. From 1973 to 1983 DeWitt served as an Adjunct Research Associate of the SUNY Music Dept. Working in collaboration with Vibeke Sorensen and Dean Winkler, DeWitt has produced several award winning visual music videotapes under the rubric of WTV.